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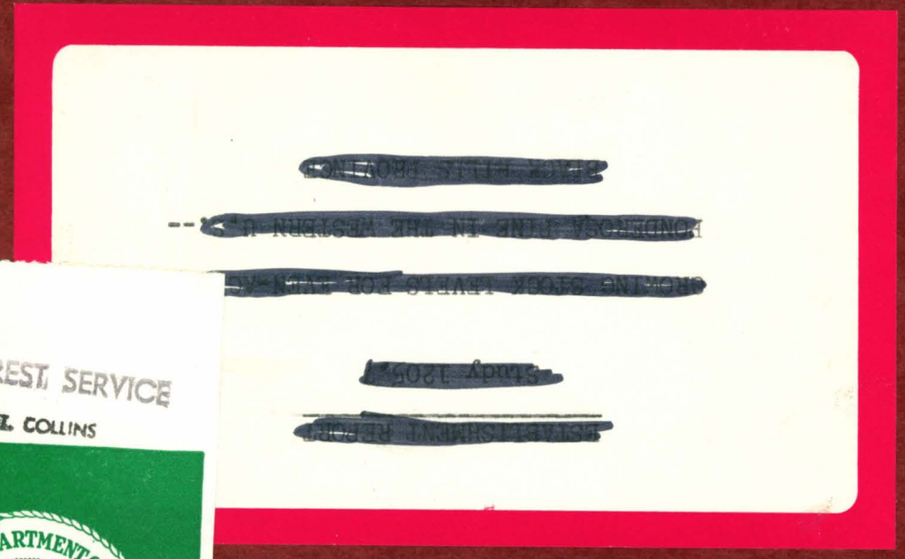
GENERAL TIMBER MANAGEMENT STATEMENT
ROOSEVELT NATIONAL FOREST
COLORADO, 1959



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GENERAL TIMBER MANAGEMENT STATEMENT

ROOSEVELT NATIONAL FOREST

Colorado

1959

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PLANS - Roosevelt
Timber Management
Roosevelt Working Circle

GENERAL TIMBER MANAGEMENT STATEMENT

U. S. DEPARTMENT OF AGRICULTURE

ROOSEVELT NATIONAL FOREST, REGION 2

COLORADO

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Approvals:

Forest Supervisor — May 4 — 19 58

Acting Regional Forester — May 18 — 1959

Acting Chief, Forest Service — June 18 — 1959

Initials of Reviewing Divisions:

Regional Office Initials	Date		Washington Office Initials	Date
HCE	5/7/59	Timber Management	JJ	6/17/59
BHC	5/7/59	Range Management	CL	6/15/59
[illegible]	5/11/59	Wildlife Management	MS	6/4/59
[illegible]	5/11/59	Recreation & Lands	MAM	6/10/59
EJA	5/11/59	Watershed Management	W.L.S.	[illegible]
[illegible]	5/14/59	Engineering	C.T. Sullivan	5/27/59
[illegible]	5/18/59	Fire Control	[illegible]	5/21/59
[illegible]	5/14/59	Rocky Mountain Station		
Forest Mgt Research			CEQ	6/12/59

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INTRODUCTION

Timber management plans for the Roosevelt National Forest are in two parts: (1) General Timber Management Statement, and (2) Working Circle Plan.

The general statement includes background material, the condition of the forest at the time of the 1957 Forest Survey, coordination with other uses, and long range management objectives. Frequent revisions of this statement should not be necessary.

Short-term objectives and programs including calculation of the allowable cut, cutting budgets, road construction needs, reforestation, etc., are in the working circle plan. This plan will be revised as necessary to fit changing conditions, at least once each ten years.

Multiple-use management guides for the forest are included in Eastern Colorado Subregion Land Management Plan. People dealing with the application of timber management plans must be familiar with these guides as well as forest plans for other resources.

GENERAL DESCRIPTION OF THE FOREST

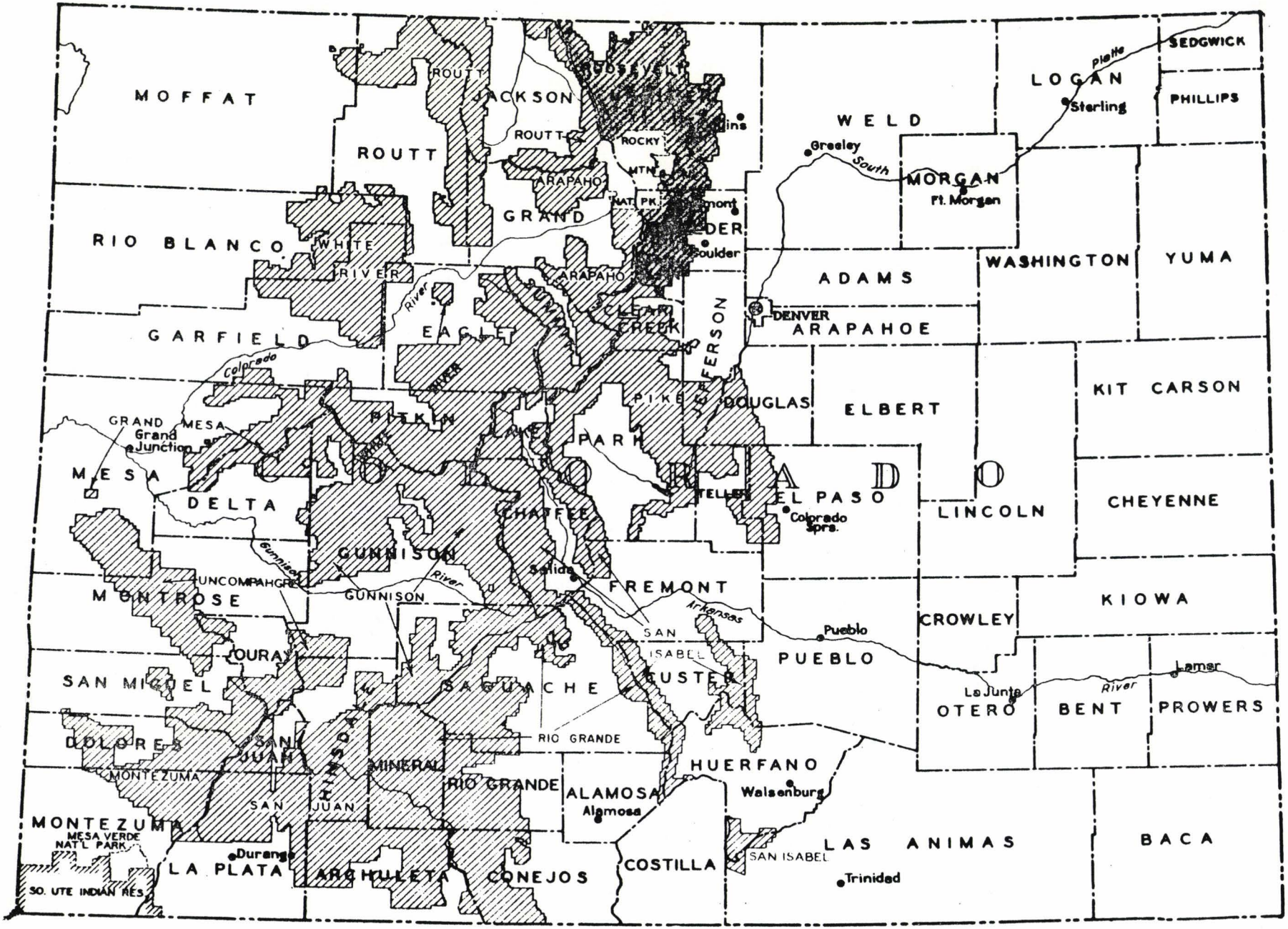
1. Location

The Roosevelt National Forest is located in the north central portion of the state of Colorado. See page 2 for map. It includes portions of Larimer, Boulder, Gilpin and Jefferson counties. The north boundary of the forest is the Colorado-Wyoming state line; the west boundary is the Medicine Bow Divide in the northern portion and the Continental Divide in the southern portion; the south boundary is the divide between the Boulder Creek and Clear Creek drainages in Gilpin County and the east boundary is the foothill zone from the Wyoming state line to vicinity of Mt. Thorodin. The boundaries are clearly defined by natural topographic features and surveyed forest boundary lines.

2. Working Circles

All of the forest is included in one working circle known as the Roosevelt Working Circle.

Each ranger district constitutes a management block.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ROCKY MTN. NAT. PK.
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GRAND
RIO BLANCO
WHITE RIVER
GARFIELD
EAGLE
Colorado River
PITKIN
GRAND
Grand Junction
MESA
DELTA
GUNNISON
UNCOMPAHGRE
GUNNISON River
MONTROSE
OURAY
SAN MIGUEL
DOLORES
SAN JUAN
MONTEZUMA
MONTEZUMA
MESA VERDE NAT'L PARK
Durango
LA PLATA
SO. UTE INDIAN RES.
ARCHULETA
CONEJOS
SAN JUAN
MINERAL
RIO GRANDE
SAGUACHE
CHAFFEE
PARK
SUMMIT
CLEAR CREEK
JEFFERSON
PIKE
TELLER
EL PASO
Colorado Sprs.
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FREMONT
SAN ISABEL
CUSTER
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ALAMOSA
Alamosa
COSTILLA
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LAS ANIMAS
Trinidad
BACA
PUEBLO
Pueblo
CROWLEY
OTERO
La Junta
BENT
PROWERS
Lamar
KIOWA
Arkansas River
LINCOLN
CHEYENNE
KIT CARSON
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DOUGLAS
ARAPAHOE
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To : Ed Gryczan
Timber Management

cc: Sonny Stiger

DATE OF MESSAGE	Routing Symbol
5/19/76	

SIGNATURE OF ORIGINATOR

Ed Day

TITLE OF ORIGINATOR

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INITIAL MESSAGE

Here is a copy of the breakdown of acreage for the Roosevelt. There is agreement at the WO & RO levels in the values shown in the right most column which is a matter of record on the forest. We plan to use these acres for calculating the Roosevelts Inventory data.

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OPTIONAL FORM 27
JULY 1973
GSA FPMR (41 CFR) 101-11.6

ROOSEVELT RE-INVENTORY

Area Determination
5/76

	Previous Inventory (1957)	N.F. Systems Bulletin (WO) (6/30/74)	Annual Statistical report & WO systems Bulletin (6/30/75)
Gross Area	1,080,540	1,082,425	1,082,417
Other Owners	294,179	300,788	300,791
Net N.F.	786,361	781,637	781,626
Reserved	19,790	26,674	26,674
Non-reserved	766,571	754,963	754,952
Commercial	536,394		
Non-commer.	152,690		
Non-Forest	75,777		
Non-Cen-Water	1,710		
Deferred*		115,100	115,100
Rawah (east)		18,000	18,000
Montgomery Pass		2,400	2,400
Shipman Park		9,700	9,700
Indian Peaks		30,000	30,000
Commanche Big So.		47,000	47,000
Neota-Flattops		8,000	8,000

*From RARE report dated Oct 1973

County,	Gross Acres	Other Owner	Net N.F. Acres	Reserved	Non-Reserved
Boulder	210,450	72,728	137,722		137,722
Gilpin	43,997	17,593	26,404		26,404
Jefferson	642	482	160		160
Larimer	827,328	209,988	617,340	26,674 net 790 other 27,464 Gross	590,666
Total	1,082,417	300,791	781,626	26,674	754,952

3. Area by Ownership

	TOTAL AREA		COMMERCIAL FOREST LAND			
	Gross (Acres)	Net (Acres)	Nat'l Forest (Acres)	State, Co. & Munic. (Acres)	Private (Acres)	Total (Acres)
Boulder	207,751	130,150	75,737	2,830	49,005	127,572
Estes Park	171,197	111,715	50,695	140	28,280	79,115
Laramie River	190,758	182,721	131,903	425	2,711	135,039
Poudre	231,546	177,943	143,567	3,559	31,851	178,977
Redfeather	279,288	183,822	134,492	1,025	52,775	188,292
Total Forest	1,080,540	786,361	536,394	7,979	164,622	708,995

4. General Topography

The topography of the Roosevelt Working Circle is varied. The area in the Boulder and Estes Blocks embraces a rough, ragged, mountainous region. The streamflow is in an easterly direction and breaks the country into distinct drainages; namely, Boulder Creek, St. Vrain River, and Big and Little Thompson Rivers. The creeks and rivers flow through steep-walled canyons in the eastern portions of the blocks and traverse rolling valleys in the central and western portions.

On the Poudre and Redfeather Blocks, the main drainages are the North Fork Cache La Poudre, Big South Cache La Poudre, Main Cache La Poudre River, Buckhorn Creek, and Sheep Creek. These streams flow in an easterly direction. The upper and west end of the Poudre Block runs out on a high divide, the Mummy Range. North of the Cache La Poudre to the State line in the Redfeather Block, the terrain is plateau-like with exception of the foothill zone which is comprised of short steep hills, rocky ridges and narrow stream bottoms.

South of the Cache La Poudre the high Mummy Range runs down to the river and crowds the central plateau into a relatively small area west of the South Fork of this river. Here the eastern portion of the block is in the foothill zone and terrain is similar to the eastern portion of the Redfeather Block. The Laramie River Block is characterized by a high plateau and deep canyons. The ground slopes to the north and is cut by the Laramie River which flows northwest. This stream is fed by tributaries entering from west and east from each of its steep-rimmed canyon walls. The lower portion of the block which is commonly called the "Roach Country" is more plateau-like and easily accessible.

Elevations range from 5,200 feet, low point on the Poudre River, to 12,965 feet, Clarks Peak in the Medicine Bow Range. The best merchantable timber lies between the elevation of 8,000 to 10,500 feet.

5. Soil Types

See Soil Type Map, page 5.

6. Climate

The climate of the Roosevelt National Forest ranges from continental to semi-arid. The summers are short and dry and the winters are long and cold. These conditions vary greatly with elevation changes.

a. Precipitation

Average annual precipitation for the forest ranges from 15" to 30". Snowfall accumulates to a depth of from 60" to 70" at the extreme upper elevation limits during the winter to negligible in the lower ponderosa pine zone. The maximum snow melt usually occurs in the month of May but it may occur as late as June.

b. Winds

Strong northwesterly winds are common along the northernmost limits of the forest. Winds on the remainder of the forest are relatively moderate. Wind is a definite factor in the silviculture of the lodgepole and Engelmann spruce types. Strip-clearcutting permits the harvesting and close utilization of these two species without serious danger of extensive windfall. Uncut strips reduce wind movement decreasing evaporation and prolonging the period of snowmelt.

c. Temperature Range

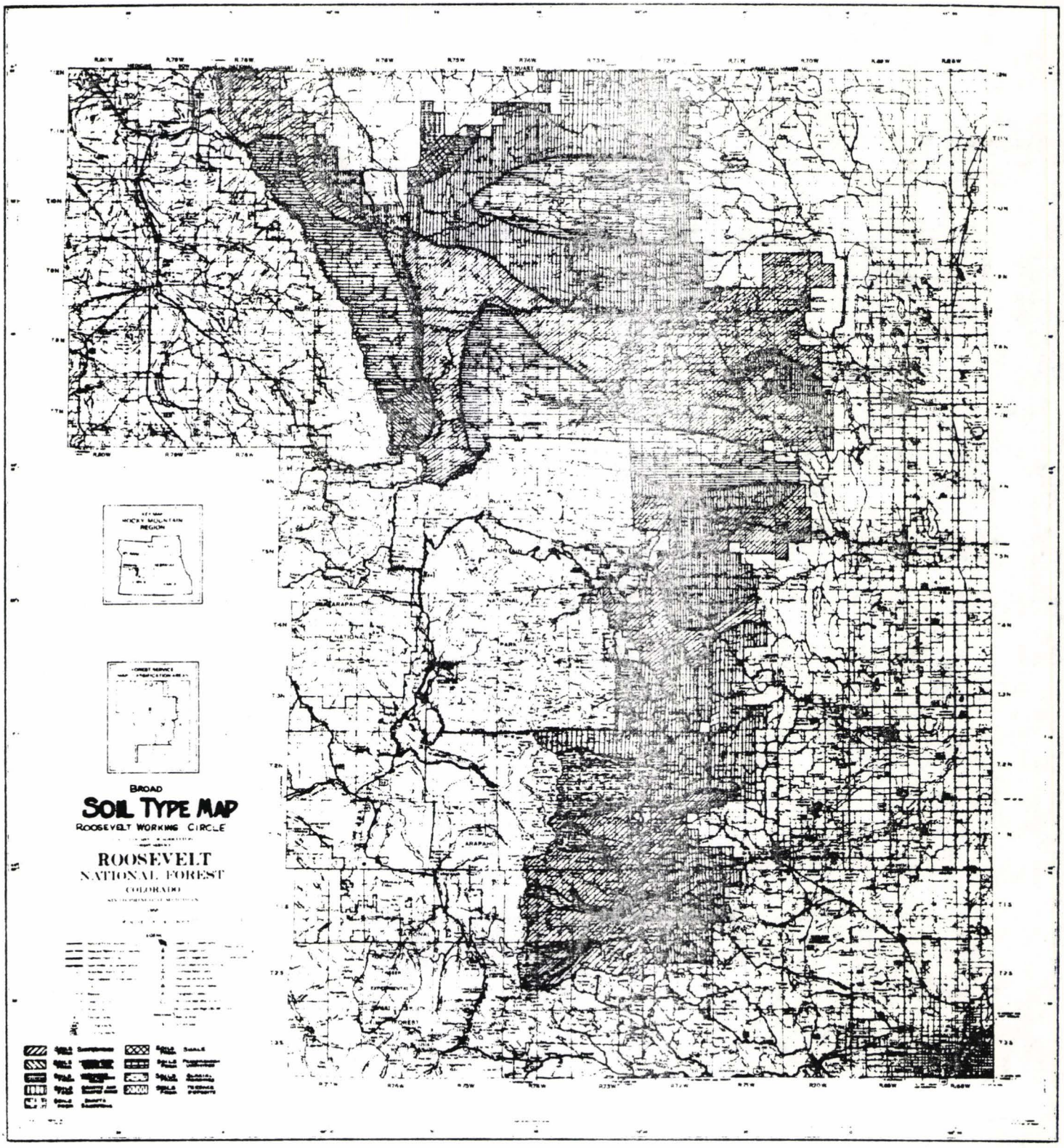
Temperatures at lower elevations range from -40°F to 100°F. The average frost free period is about 100 days. At the higher elevations summer frost is not uncommon.

Logging operations are at a standstill from November 15 to mid-May in the high altitude types. The lower lodgepole pine fringe type and the ponderosa pine type are suitable for limited winter operations.

7. Cover Types (See Land Proportion of Types, Page 7)

Lodgepole Pine Type. This is the most extensive type, comprising approximately 50 percent of the merchantable operable timber area. This species occurs in even-aged stands but not necessarily even-sized. In typical mature stands the trees have an average diameter of 13 inches. The average sawtimber tree yields two logs, and cull in this species runs about 20%. Because of its intolerance, even-aged character and the ease with which it reproduces itself, the species or type lends itself best to some form of clearcutting.

MAP NUMBER ONE



Lodgepole pine usually grows in very dense stands, many of which get their start following fires. This situation results in early growth stagnation producing smaller logs than any of the other species in the working circle.

In addition to lumber, this species provides poles, ties, and studs.

Lodgepole pine is also characterized by the prevalence of dwarfmistletoe. This includes all age classes in both cutover and uncut areas. The disease is beginning to show up in reproduction, over five years in age, on most of the cutover areas. Frank G. Hawksworth[1] estimates that 52 per cent of the area of the three northern ranger districts is infected.

Engelmann Spruce - Subalpine Fir Type

The bulk of the type is located in the upper end of the Poudre and Laramie River Blocks. This type has been invaded only to a minor extent by cutting, fires, and insects.

The average merchantable tree contains 3 to 3-1/2 logs. Individual mature trees attain considerable size, reaching a maximum of 40" in diameter. Defect in spruce ranges upward to 15% and in subalpine fir to 20%. However, the subalpine fir is rather unimportant as it comprises only 9% of the total volume of the stand, usually occurring in the small diameter classes. The type is largely confined to elevations above 9,000 and runs up to timberline; however, there are small scattered patches along stream bottoms below this elevation.

Ponderosa Pine Type

This type varies from thrifty well-stocked stands to open stands with relatively few stems per acre. Scattered stands occur at the lower edge of the timber zone. When growing on exposed sites, the timber is often scrubby in appearance. The sites occupied by much of this type are generally rocky or gravelly soils of low productive capacity.

Merchantable trees average two logs in length with a defect of 18% in trees to be removed in the first harvest cut. Dwarfmistletoe is quite prevalent in many localities, influencing form and stand development. Porcupine damage to date has not been considered a problem. Epidemic attacks by the Black Hills bark beetle have occurred in some areas.

Douglas-fir Type

Most of this type is in immature stands of small poles. Pure stands occur in small scattered patches on north slopes. Most of the type is mixed with the ponderosa pine.

Mature trees are relatively sound and average 2-1/2 logs per tree. Cull percentage is about 18% or the same as for ponderosa pine. In recent years the activity of the Douglas-fir bark beetle has become more common.

[1]Rocky Mountain Forest and Range Experiment Station Paper No. 35

Minor Types

Limber pine is found scattered in all other types and occasionally in small pure patches on rocky ridges and exposed sites. This species is relatively unimportant for commercial use but is important as a cover type for watershed protection.

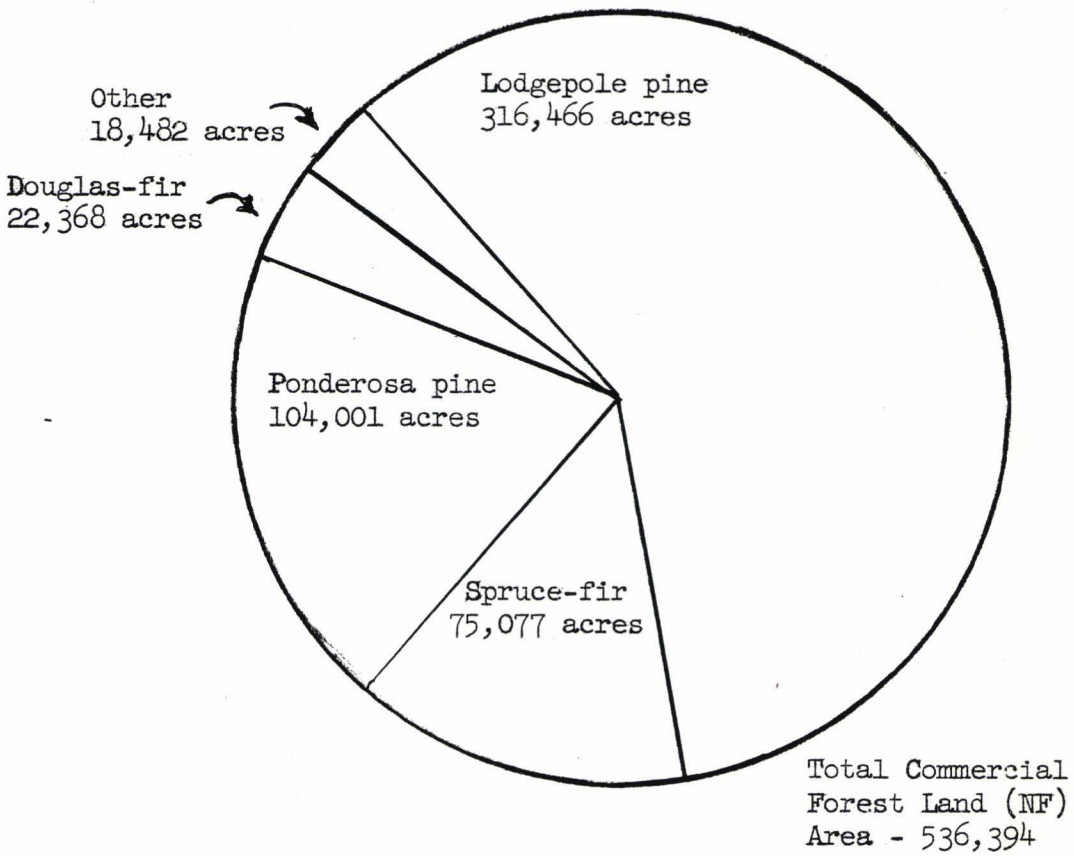
Blue spruce occurs in narrow stringers along stream bottoms. When growing in pure stands it will yield as high as 10 M feet per acre. This species has high aesthetic and watershed values but occurs too sparingly to be of commercial importance.

Aspen stands are found in small patches throughout the forest. The trees are usually scrubby and very defective.

Other Woodland or Principal Vegetative Types

Brush types which include sagebrush, juniper, bitterbrush, mountain mahogany, and ceanothus are rather scattered and characteristic to the rough rocky ranges of the main drainages. They occur throughout the lower ponderosa pine zone and in the open areas and are primarily important for watershed protection and wildlife habitat.

Area of Commercial Forest Land by Timber Types



Rev. 6/1/60

HISTORY OF TIMBER USE

1. Cutting

The history of cutting on the Roosevelt Forest goes back to the 1860's. Practically all the merchantable timber at the lower elevations, principally that in the ponderosa pine type, was cut prior to the creation of the forest. Even after the forest was established, a considerable part of the cut was made under trespass. Many of these early operations were of a high-grading nature. Early cutting of the more accessible lower elevations has left the bulk of the merchantable timber on the forest in the Engelmann spruce and lodgepole pine types.

In the northern part of the forest, the first sawmills in and contiguous to the Roosevelt National Forest were in operation in 1862 in Rist Canyon and near LaPorte, Colorado, the latter being on the Poudre River. From these early mills, lumber was sawed for building material used in Greeley, the lumber being floated down the river to Greeley. A few years later, the logs themselves were floated to Greeley and sawed into lumber at that place. With the advent of the Denver and Pacific Railroad, tie camps were established in 1867 when ties were cut in great number and floated down the Cache La Poudre River and its tributaries for use in the construction of the first railroad in this region. About this same time, "Tie Hacks" were cutting ties in the Laramie River and its tributaries, such as McIntyre, Nunn and the West Branch Creeks, and floating them down the river to Laramie, Wyoming, for use in the construction of the Union Pacific Railroad. In the late 1920's, logging contractors began furnishing sawed ties with a resultant discontinuance of the purchasing of hewed ties by the railroads by the late 1930's. Portable mills, located at various points in the northern part of the forest, supplied the local demand for lumber for many years, but lumber from the Northwest began to replace local lumber about 1910. Much of the lumber now produced on the forest is shipped to the mid-western states.

In the southern part of the forest early history followed much the same trend as in the northern part of the forest. The discovery of gold and settlement of Rollinsville and Ward created a keen demand for forest products for the construction of homes and for the mining industry. The first sawmill was established about 1861 where the town of Rollinsville now stands. From that time to about 1915, lumbering was one of the chief industries and areas were cut over, some two or three times, with sawmills having operated in nearly every gulch.

After 1914 the sales activity increased, particularly in the Laramie River Block in the vicinity of the Roach. For the period from 1915 to 1928, inclusive, the average cut per year was nearly 5200 MBM. From 1929 to 1958, the annual cut increased to 10,714 MBM due to better market conditions, better transportation methods, and increased accessibility. The cut in this period has left large cutover areas on the Laramie River and Redfeather Blocks.

Graphs on Pages 10 and 11 illustrate the volume, value and average selling price of convertible products cut on the forest for the period from 1915 through Fiscal Year 1958.

2. Fire

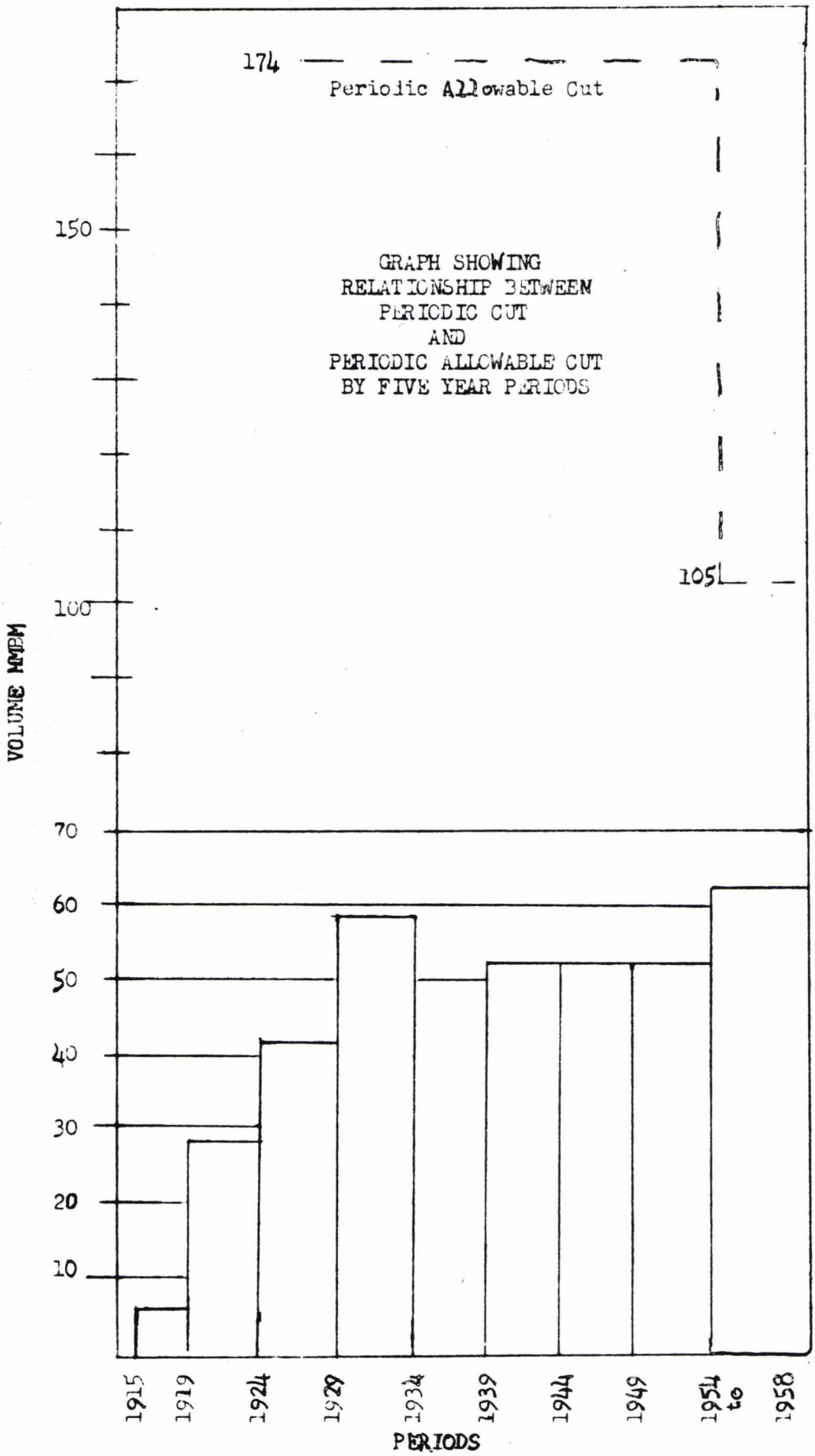
Since the arrival of the first settlers, past records indicate that severe fires occurred throughout the forest. A large fire did severe damage west of Twin Peaks in 1860. In 1876, the McIntyre burn occurred. This fire started on the west side of the Medicine Bow Range and burned east towards the Laramie River. Other large burns occurred in 1880 on the east slope of the Mummy Range, the Miller's Fork Burn of 1905 and the Stove Prairie fire of 1909. Other fires of unknown date have burned many acres in the mountainous area west of Boulder.

Since the establishment of the forest, some one thousand four hundred and five fires occurred during the period from 1909 to 1958. Of these 69.7 percent were man-caused, and 30.3 were caused by lightning. For the period from 1940 to 1958 six hundred and sixty-six occurred. Of these 60.6 percent were man-caused and 39.4 percent were caused by lightning.

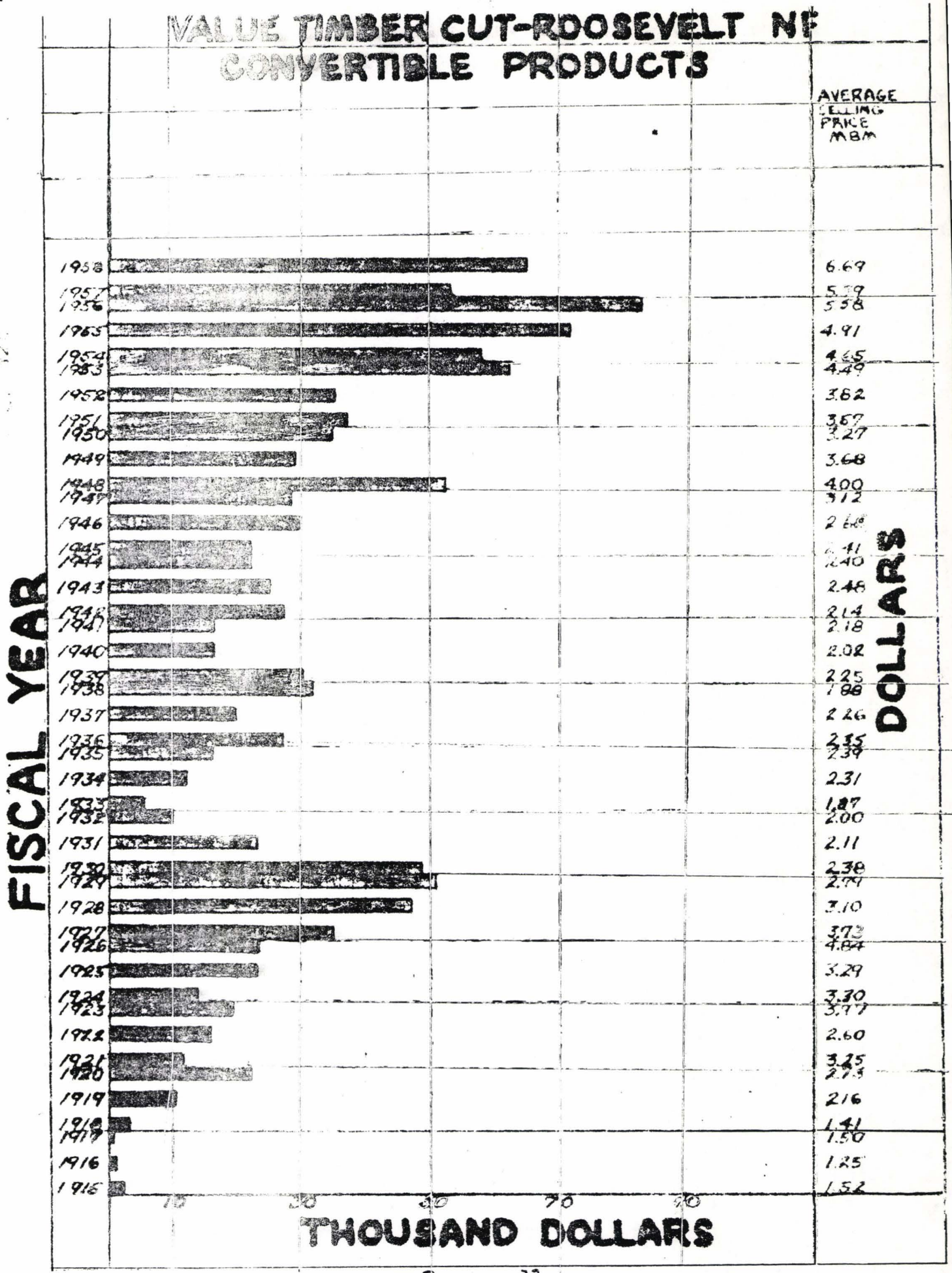
The graph on Page 12 indicates the volume of timber destroyed, Figure 1, and value of timber and non-timber resources destroyed, Figure 2, for the period from 1940-1958. On Page 13 is a graph illustrating the average annual area burned by causes, Figure 1, and average annual number of fires by causes for the period from 1940-1958.

Larger fires that have occurred during the past three decades are as follows:

Fire Name or District	Year	Acreage
Little South	1954	256
Maitland	1953	283
George Creek	1952	1,214
Laramie River District	1944	170
Laramie River District	1944	1,190
Poudre District	1943	230
Panhandle	1939	1,009
Boulder District	1938	664
Boulder District	1934	390
Boulder District	1932	450
Boulder District	1932	500


174
Periodic Allowable Cut
150
GRAPH SHOWING
RELATIONSHIP BETWEEN
PERIODIC CUT
AND
PERIODIC ALLOWABLE CUT
BY FIVE YEAR PERIODS
105
100
VOLUME MMBM
70
60
50
40
30
20
10
1915
1919
1924
1929
1934
1939
1944
1949
1954 to 1958
PERIODS

VALUE TIMBER CUT-ROOSEVELT NF
CONVERTIBLE PRODUCTS



FIRE LOSSES-ROOSEVELT NF 1940-1958

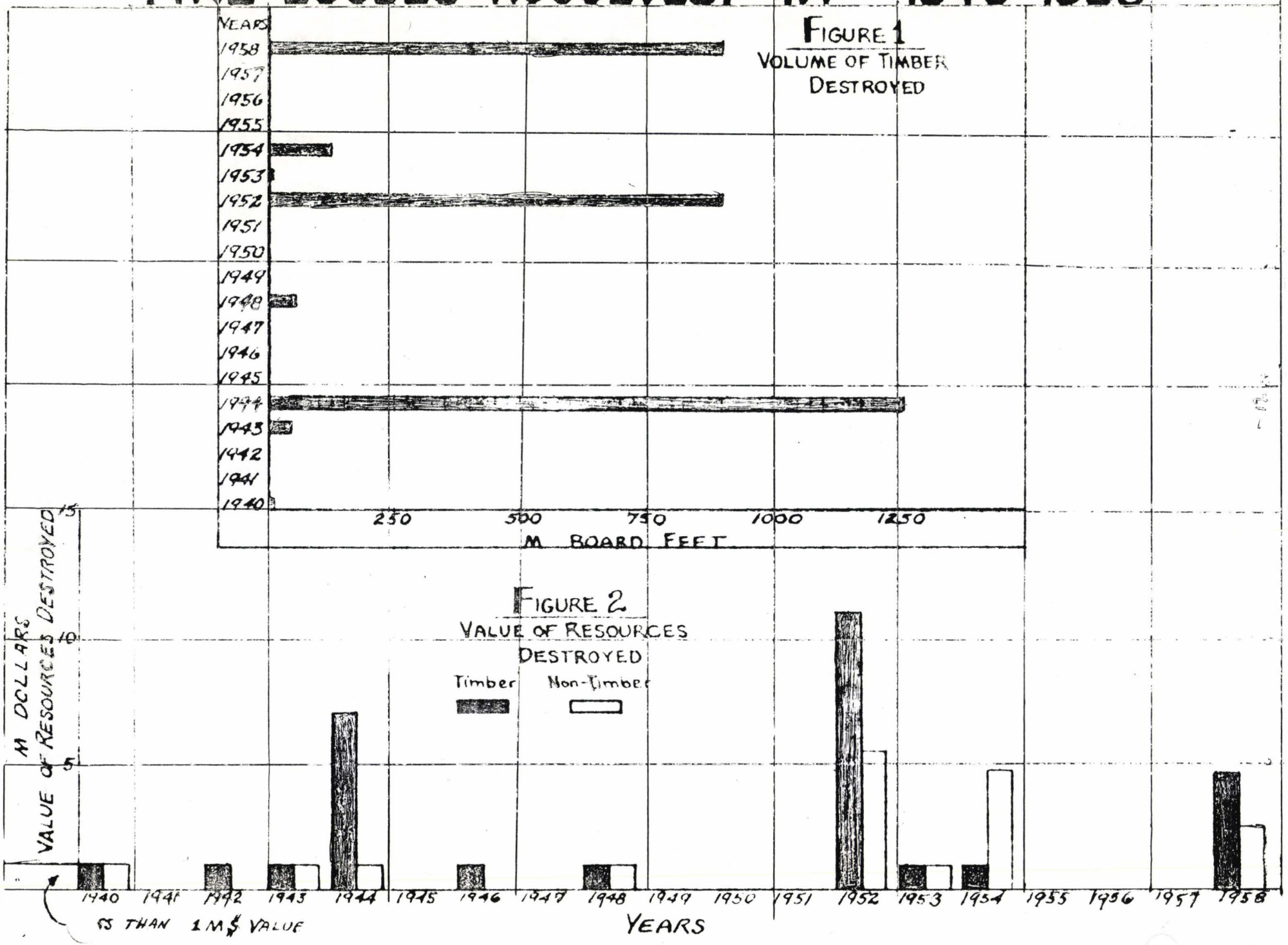


FIGURE 1
VOLUME OF TIMBER DESTROYED

FIGURE 2
VALUE OF RESOURCES DESTROYED

FIGURE 1.

AVERAGE ANNUAL AREA BURNED BY CAUSES
1940-1958 NATIONAL FOREST LAND

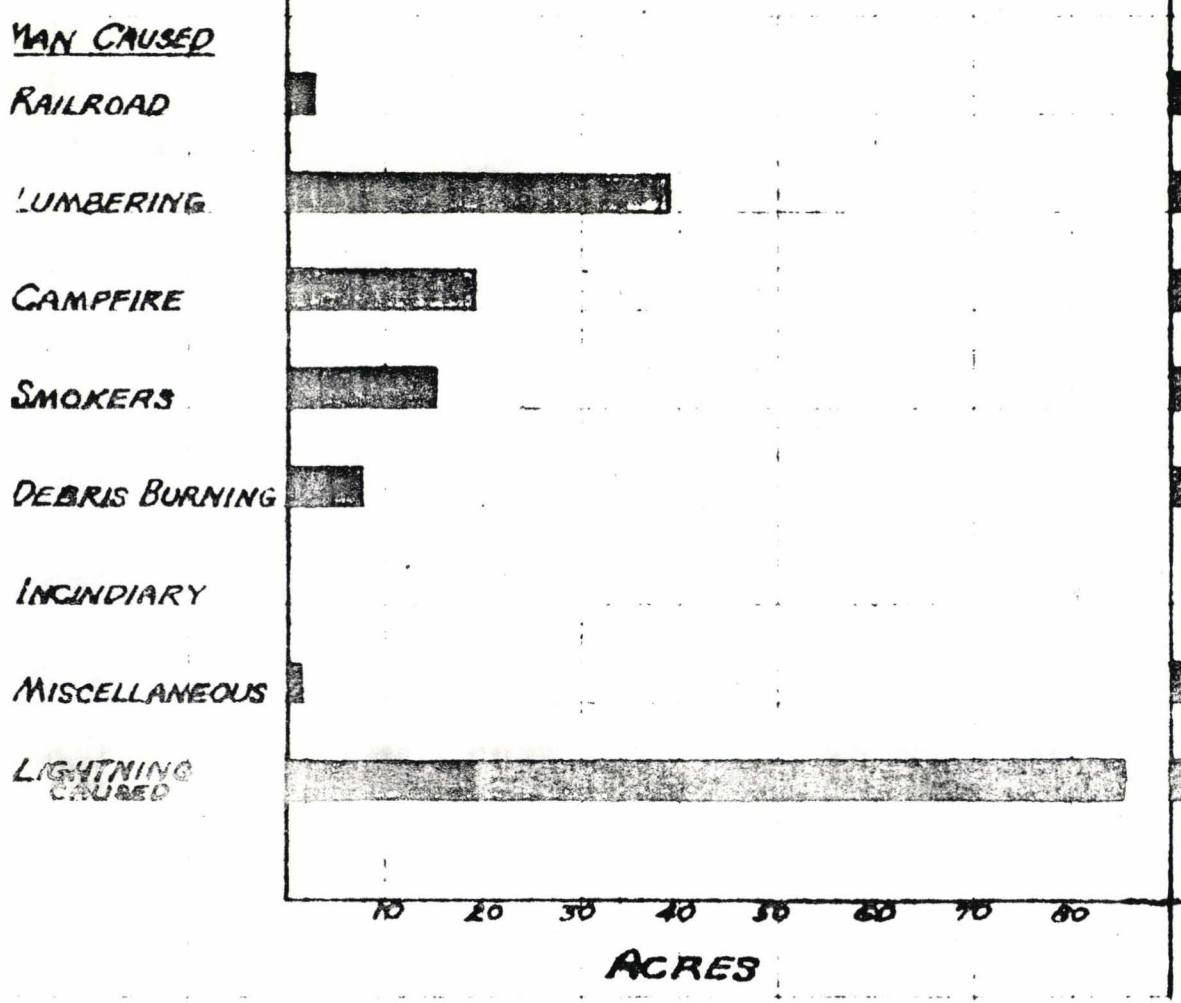
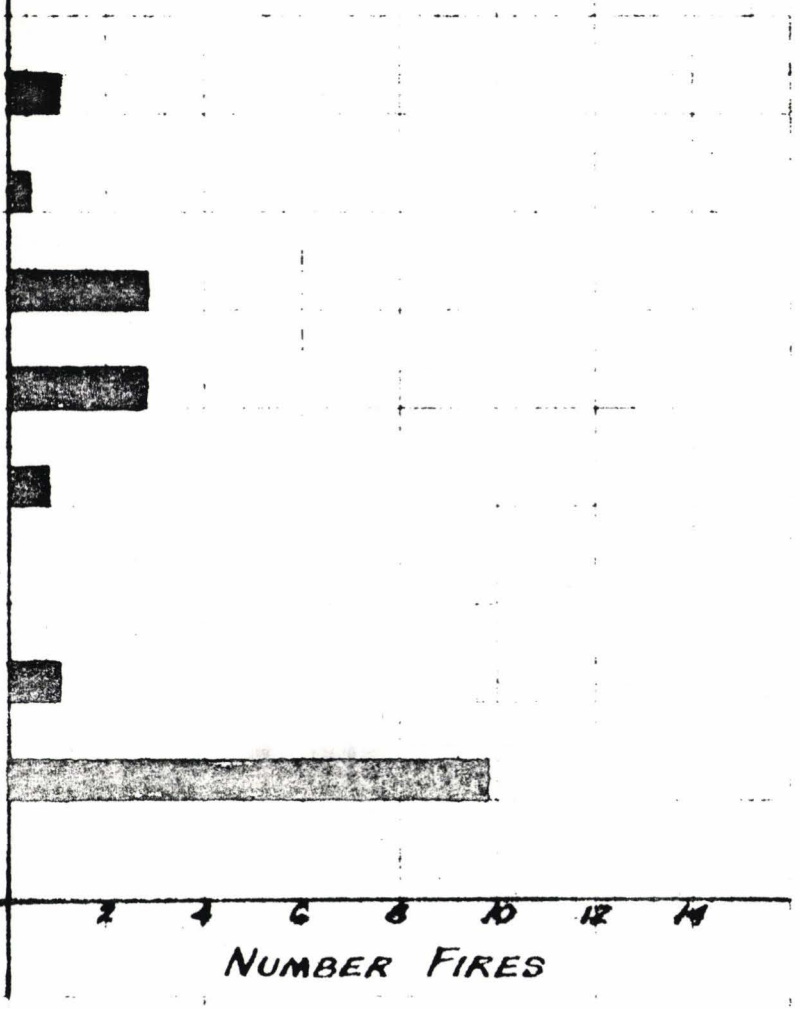


FIGURE 2.

AVERAGE ANNUAL NO. FIRES BY CAUSES
1940-1958 NATIONAL FOREST LAND



3. Regeneration

a. Natural

In the early years after the establishment of the forest, it was recognized that in the management of lodgepole pine a system of clear cutting would provide the most desirable silvicultural system for this type. Because of the limited demand at that time the general practice was to favor a modified shelterwood and selection system. Neither of these systems favored the establishment of reproduction except where the merchantable timber was removed by patches. Where the canopy was opened in the early hewed tie operations reproduction is found in the openings within the decadent stands. Where the mature stands were not opened sufficiently, reproduction has not occurred. Established reproduction in many areas is infected with mistletoe. In the past a number of infected trees have been left on practically all cutover areas. These residual trees infected with dwarfmistletoe have generally passed the disease on to the younger trees with a resultant heavy infection in submerchantable-sized classes. Sixty-seven percent of the reproduction in cutover stands of lodgepole pine are infected with dwarfmistletoe. In regenerated burns following fires in more recent years, the dwarfmistletoe infection is not as severe in the reproduction since the fires had been severe enough to destroy a large proportion of the infected overstory trees. In general, reproduction tends to be satisfactory, however, cutover surveys are needed to develop sale area betterment programs to bring cutover areas into full production.

In the spruce-fir type little reproduction follows clear cutting or wild fire. This will vary somewhat depending on the aspect. Limited observations of some clear cut areas with northerly aspects indicate a higher percent restocking with spruce and alpine fir than on southerly aspects. At the lower elevational range and on northerly aspects where the type associates with lodgepole pine, some cutover areas have restocked satisfactorily with a pine-spruce-fir mixture.

Natural reproduction does not always occur following selective cutting of ponderosa pine. This is primarily due to the lack of satisfactory seed crops, satisfactory seed beds followed by sufficient moisture. Dwarfmistletoe is also prevalent on a large percent of the reproduction in selectively cutover stands. Observations have indicated that this disease causes premature death of reproduction heavily infected with mistletoe.

b. Artificial

Beginning in 1912 and extending through 1941 a number of plantations were established on the forest. Most of these were in the lower fringe of the ponderosa type where precipitation is low, exposure to damage by wildlife and livestock is high and the influences of sunlight are high. These adverse conditions plus using other than first-grade seedlings grown from local seed, attempting to plant on sites where

ponderosa pine had not grown in the past and non-protection of seedlings from browsing animals resulted in failure of many acres planted. Failure of early attempts (1909-1911) to broadcast seed were due primarily to drought and broadcast seeding on unprepared seed beds and directly on the snow.

In recent years artificial regeneration has been limited to small scale plantings made primarily by women's clubs, Boy Scouts, Kiwanis Clubs, Colorado Mountain Club, and communities.

4. Insects

Ponderosa pine and Douglas-fir are the only species that have been subjected to insect epidemics. Control measure for Black Hills beetles (Dendroctonus ponderosae Hopk.) in ponderosa pine goes back to the early 1930's. An estimated 2,000 MBM of ponderosa pine were killed in 1927 on the Boulder and Estes Park blocks. Some 36,720 trees were killed in 1947 and 20,730 trees were killed in 1948 in the same blocks. The attacks were in groups ranging from 10 to 50 trees in both pole and thrifty small sawtimber stand size classes. Since 1948 the populations of Black Hills beetle have been at an endemic level.

Douglas-fir beetle (Dendroctonus pseudotsugae Hopk.) infestations have been just as serious as that of the Black Hills beetle in the number of trees attacked. Control work for this beetle has never been initiated due to the lack of commercial value of the species in the region and the lack of technical knowledge on the control of the insect. Pilot control projects now are underway in the region.

5. Disease

Total damage done by the various tree diseases is difficult to evaluate but with recent disclosures from studies it now must be considered to be of primary importance in the timber management program. In past years disease control has been practically non-existent, action being taken only in small experimental acreages on the district level and in enforcement of the standard disease tree clauses of the sale contracts.

Dwarfmistletoe (Arceuthobium americanum Nutt ex Engelmann) on lodgepole pine and dwarfmistletoe (Arceuthobium vaginatum Willd. Presl) on ponderosa pine are serious diseases encountered on the forest. Surveys indicate that more than half the commercial type of lodgepole is infected to some degree. This parasite is responsible for about a one-third stand reduction in normal growth and a marked increase in mortality. New sales made within the last year have initiated mistletoe control programs.

In 1957 research studies on peridermium rust were undertaken by the Rocky Mountain Experiment Station. As of now their findings are yet undisclosed as to the extent of damage done to lodgepole stands.

Losses from rots are caused primarily by western red rot (Polyporus anceps) and white pocket rot (Fomes pini). Average loss due to rot defect runs as high as 50% in overmature stands. Management objectives should be to harvest these overmature stands as first priority.

6. Other

Porcupine damage to young timber has not been considered of a serious nature in the past. Limited control carried on by forest officers coupled with natural factors have kept the porcupine population to a minimum.

Windstorms and cyclones have caused some losses over the past years. Records of these losses are rather vague. The only substantial information is that of a severe windstorm on the Redfeather District on August 7, 1954. This storm blew down 100 acres of lodgepole timber with estimated volume of 100 MBM.

COMMUNITY - TIMBER RELATIONSHIPS

1. Population Centers

There are some 519,021 people living in communities within or adjacent to the Roosevelt National Forest. Smaller communities within the forest are Redfeather Lakes, Drake, Glen Haven, Allenspark, Ward, Jamestown, Nederland and Rollinsville. These small communities are more or less dependent upon the timber industry of the forest to some extent. Other principal communities benefited by the forest timber resource to some extent are the following:

Communities	Population (1950 Census)
Laramie, Wyoming	15,580
Fort Collins, Colorado	14,926
Loveland, Colorado	6,773
Berthoud, Colorado	8,867
Greeley, Colorado	20,285
Lyons, Colorado	689
Longmont, Colorado	8,099
Boulder, Colorado	19,916
Denver, Colorado	415,786
Estes Park, Colorado	1,617

The above figures are based on the 1950 census. The greater metropolitan area of Denver is now considered to have a population of 861,000.

All of the above principal communities adjacent to the forest are steadily and rapidly increasing in population. This increase in population and new uses of wood means that these communities will be more dependent on the timber resources of the forest in the years to come.

2. Forest Industries

In the area within and adjacent to the Roosevelt Working Circle the forest industry has never been fully developed and stabilized. At one time there were as many as 25 separate operators cutting national forest timber. Fluctuations in stumpage and market prices and demand, influence the amount cut by these operators. This production has ranged from 50 MBM annually for the smallest operator to 8,000 MBM annually for the largest operator. The estimated current capacity of the lumber producing industries in the area is 16,000 MBM annually. Actual annual cut is around 10,000 MBM. The annual allowable cut for the Roosevelt Working Circle has been set at 21,000 MBM for the period from 1949 to 1959. Market studies conducted by P. L. Ginter and C. K. Collins 1/ in 1940 indicate that there is a definite market and need for native products within the working circle area of influence. The minimum market possibility has been estimated at 200 million board feet annually or considerably in excess of the working circle output. There remains no question that a market exists for all local lumber and minor products that can be produced. There is a definite need for development of an integrated wood-using industry to supply this demand. The principal need is for a concentration yard and finishing plant in or near the vicinity of Fort Collins. The large sales now in existence and those proposed in the future will be in the Poudre and River Blocks. Transportation routes naturally funnel into the Fort Collins area. A plant with a gang or band mill, planing mill, dry kiln, and remanufacturing facilities with a capacity of 8,000,000 BF annually could be supplied from this working circle. This would leave sufficient timber available to take care of needs of existing operators.

Posts, poles, props, and other minor products, are being processed in the marketing area. The two largest are Broderick Wood Products in Denver and Nebraska Bridge in Laramie. There are several small plants locally. There is sufficient timber volume for a great expansion in this field. Increased sales of available round timber is being encouraged in order to acquire cleanup of mistletoe infected trees following sawtimber operations and in releasing and thinning of suppressed stands.

Needed in the marketing area is a pulpwood or excelsior industry. In addition to the annual allowable cut of sawtimber, available in other volumes, in 4-10" trees from thinning or clear cutting mature lodgepole pine and Engelmann spruce, is an estimated available cut of 6,000 cords annually. Since there are certain economic factors limiting pulping operations and since demand for timber for local use probably never will equal the productive capacity of the forest, an excelsior industry in the marketing area is needed to take its proper place in the local and national economy. The principal species -- Engelmann spruce, alpine fir, and lodgepole pine -- are well suited to excelsior. Preferably an excelsior mill or possibly a pulp mill, therefore, is needed in the marketing area to develop utilization of the timber resource.

1/ A Survey Concerning the Marketing of Timber Products of the Roosevelt National Forest - 1940.

Full utilization of the timber resources available on the Roosevelt Working Circle should provide employment to over 200 permanent workers and 250 seasonal workers.

3. Permanent Transportation Network Including Principal Highways and Railways

The working circle is served by an excellent pattern of highways and railways making it accessible to the most heavily populated area in the Rockies and to the high plains region.

The Union Pacific and Colorado & Southern Railroad systems provide adequate rail transportation north, south and east from the cities of Fort Collins, Loveland, Longmont, Boulder and Laramie for lumber and other products of the working circle. Spurs located at Tie Siding, Wyoming, and Owl Canyon, Colorado, provide supplemental facilities for shipment by rail for products of the Laramie River, Redfeather and Poudre Blocks.

U. S. Highway 287 skirts the east side of the working circle in a north-south direction at a distance of one to nine miles. It passes through the cities of Fort Collins, Loveland and Denver. U. S. Highway 87 joins U. S. Highway 287 at a point 5 miles east of Fort Collins. These two routes join with other U. S. and state routes which penetrate into all parts of the market area including Denver, Southeastern Wyoming, Northwestern Nebraska, and Northeastern Colorado. Other secondary U. S., state, and county routes provide a suitable network within the working circle itself. The most important of these are State Highway #14 which traverses the entire length of the Poudre Block and ties into the Laramie River road system; U. S. #34 which travels through the Estes Block; and State #7, #60, #66, #119 and #160 which provide more than an adequate transportation network in the Boulder and Estes Blocks.

Other county and forest development roads tie into this system of main roads so that in most cases the only needed access roads will be those needed from the main roads to the sale areas themselves.

Summary of the
Roosevelt National Forest Development
Transportation Plan
as of June 30, 1958

Primary Forest Value	Miles: Existing	Additional Need	Total
Timber	428	2,140	2,568
Fire Control and Admin.	41	161	202
Other Resources	72	12	84
Total	541	2,313	2,854

The working circle plan will program the timber access roads needed during the ten-year period to meet the allowable cut. Priorities in construction will be coordinated with three-year sale schedules.

4. Monetary Values

The following table shows the amount of receipts received from the timber resource of the forest for the period from 1915 through F.Y. 1957. Twenty-five percent of these receipts are returned to Larimer, Boulder, Gilpin, and Jefferson Counties, based on net forest land within each county.

Year	Receipts	Year	Receipts	Year	Receipts
1915	$ 1,838	1930	$43,085	1945	$33,366
1916	1,063	1931	22,162	1946	30,333
1917	597	1932	6,145	1947	34,871
1918	6,365	1933	5,448	1948	45,085
1919	12,340	1934	12,434	1949	26,503
1920	20,503	1935	17,289	1950	30,762
1921	8,463	1936	19,372	1951	49,462
1922	23,181	1937	18,306	1952	42,641
1923	20,304	1938	34,104	1953	73,111
1924	9,697	1939	37,619	1954	55,749
1925	21,127	1940	11,039	1955	84,801
1926	23,257	1941	14,072	1956	99,168
1927	34,740	1942	33,939	1957	48,790
1928	51,751	1943	23,712		
1929	46,943	1944	25,113		

5. Cooperation with Other Agencies

In order to promote good timber management, which is a broad overall term, covering all the activities relating to the propagation, growing and harvesting of trees and the management of forests and woodlands for forestry uses or purposes, the Forest Service is ready to assist other agencies to the extent possible to make every acre of forest land a fully productive acre. The personnel of the forest will continue to cooperate with the State Game and Fish Department, Colorado State Forest Service, and Colorado State University.

Colorado State University Forestry School's summer camp is located within the forest's boundary. Students have an opportunity to visit and see the various timber activities.

6. Information and Education

The economy of the area is based upon recreation and agriculture. Comparatively few people are dependent upon logging and lumbering operations. The forest is a gateway to the Rocky Mountain National Park.

There are numerous resorts and summer homes throughout the forest. Visitors are interested in the aesthetic values of the forest. A large proportion of these visitors may never make more than one trip to the area. These people, as well as the local residents, dependent upon or purely interested in the recreation resource, must be educated and sold timber production objectives. These people will be guided by what they see. Good timber sale administration and sound silvicultural practices are essential in selling multiple-use to the public. Forest and district I&E plans will reflect action in this respect.

In working with timber sale operators, the forest will keep local and prospective purchasers informed of volumes available and of plans for offering the timber for sale. By working close with the forest users, the forest can expect to keep abreast of the industries needs, can expect to promote better utilization of the products for sale, can, through such public relations, obtain compliance with timber sale documents, and can be in a better position to learn and discuss the operator's problems.

Close working relationships will be maintained with local government, foresters, local leaders and others. Since many people are concerned with the management of the timber resource, the forest will take every advantage to inform the general public of the timber management program and the benefits of its long-term objectives. On the Roosevelt National Forest, this is considered a high priority job since many folks have some concern of the effect that the management of the timber resource will have on their particular interest. The need for working closely with the County Commissioners is one example, since the need for more intensive timber stand improvement on many of the timber sale areas will have some effect on monetary returns to the county. In order to attain this close working relationship, all forest personnel will assist with the annual job of working with Women's Clubs, Colorado Mountain Club, Hiker's Clubs, Recreational Groups, Sportsmen's Clubs, Dude Ranches, County Sheriffs, County and City and/or Town Governments, etc.

CORRELATION WITH OTHER USES

The Eastern Colorado Subregion Land Management Plan will be consulted regarding the overall objectives of multiple resource management for particular areas or segments of the working circle.

The present policy of harvesting the timber resource following the principle of "Multiple-Use Management" will be continued until detailed forest area and unit land management plans are developed within the scope of management guides provided by the subregional plan.

1. Water

Population within recent years has greatly increased the demand for water. Watershed management is essential and must be correlated with all other uses of the forest.

In timber management planning, prime consideration must be given to watershed values when block plans and sale agreements are drawn up. Plans and sale contracts should protect areas which must not be logged because of unstable soils and steep topography. Road and logging plans will be designed to protect the watershed from excessive erosion.

Silvicultural systems will be adopted for each species as to provide optimum protection to the water resource and yet produce highest yields of commercial timber products. In the lodgepole pine and spruce-fir types the block and strip clear cut methods will be used. These methods when correlated with water production permit larger amounts of rain and snow to reach the ground, reduce the amount of moisture lost through transpiration, and increase the quantity of water available for ground storage and streamflow. The ponderosa pine and Douglas-fir types will be cut by group selection, thus opening up the canopy and producing much the same results. Care must be taken in cutting practices so that higher water production can be obtained yet provide regulated runoff and maintain suitable vegetative cover and favorable soil conditions.

2. Recreation

The Recreation Plan for the Roosevelt Forest (revised 1958) makes reference to correlation with timber use and should be consulted in timber management planning and in the processing of all sales. The Chief's Policy as outlined in circular No. U-324, dated April 16, 1957, will govern all timber cutting in recreation areas and areas designated for future recreation use. Objectives and programs to be observed on all important recreational areas are as follows:

a. Conduct the harvest of timber without detriment to recreation values.

b. Roadside, trail, streamside strips and protection areas will be planned for in all timber activities in areas having heavy recreational use.

c. Logging camps, landings, log decks, and logging facilities will be kept out of recreational zones.

d. Timber access roads will be located away from streams whenever possible. Adequate protection measures will be taken to safeguard the scenic values and prevent stream pollution.

e. Buffer zones will be reserved around all important recreation areas.

f. Diseased, insect infested and safety hazard trees will be removed from recreational areas when circumstances require.

3. Livestock

In the northern four blocks of the working circle, because of the lack of much forage in the timber, there is little conflict between timber and range use.

In the southern, or Boulder Block, some damage and killing of seedlings has occurred in plantations established by local groups. With needed range reductions and proper range management practices this can be minimized. Before extensive seeding or planting can be programmed for old burns in the Boulder Block, action shall either be taken to reduce livestock numbers and resultant trampling or protection of the plantations by other means such as fencing.

4. Wildlife

The ready accessibility and nearness to population centers of the Roosevelt has made fishing and hunting a high priority use. Timber use must be correlated with wildlife management because of this heavy use. Chief concerns of wildlife management are to control the numbers of the big game and to preserve fishing streams. Winter game use on browse type plants is moderate in the foothill ponderosa pine type in the Poudre and Redfeather Blocks and the lower elevations of the Laramie River drainage. Since, at the present time, big game numbers are nearly in line with the carrying capacity of the winter range, no particular problem areas have developed where big game are damaging reproduction. Timber management also ties in with wildlife management in regard to the present system of cutting the lodgepole and spruce types in clear cut strips. This system of leaving small openings by clear cutting in these types tends to create favorable habitat conditions for game animals, logging and access roads are available to and used by sportsmen in harvesting and stabilizing the game population, and timber cover and cutting practices that protect the watershed also stabilize the run-off in trout streams and improve fishing.

The installation of browse production utilization transects, cooperatively with game department personnel, will be continued and will greatly aid management objectives and will bring the several agencies together in their thinking. It is probable that studies of this nature will result in recommendations which may have some bearing on future timber management practices.

Stream protection measures as incorporatedin recreation plans and timber sale contracts should suffice to give the needed protection streams will need for the fisherman and other forest recreation visits.

Guidelines as stated in the Wildlife Management Plan for the Roosevelt National Forest will be referred to when preparing for sales and when coordinating timber management objectives with proper wildlife management practices.

5. Mining

There are a large number of patented and unpatented mining claims on the Roosevelt Forest. The majority of these are located in areas where timber use is of minor importance. Little conflict is foreseen between mining and timber operations.

In cases where mining claims are included in prospective timber sale areas, policy and laws on use of timber on unpatented land will be followed.

Prior to examinations under P.L. 167 (7/23/55), the policy in sale activities will be to secure releases from the claimant; or if claims exist which appear to be abandoned, every reasonable effort will be made to determine the fact of abandonment. No set rule can be followed pertaining to whether a claim has been abandoned or not. Each case will be decided upon its particular circumstances.

6. Private Ownership

The total area in alienated ownership within the Roosevelt National Forest in 294,179 acres. A summary of area by blocks shows the breakdown.

Acreage of Ownership Within Roosevelt National Forest

Block	Gross	Net	Alienated
Boulder	207,751	130,160	77,591
Estes Park	171,197	111,715	59,482
Laramie River	190,758	182,721	8,037
Poudre	231,546	177,943	53,603
Redfeather	279,288	183,822	95,466
TOTALS	1,080,540	786,361	294,179

These lands in other than Federal ownership are for the most part located in the ponderosa pine zone. Exception is in the Redfeather Block where the northern portion is a checkerboard land ownership pattern and involves all timber types common on the forest.

Within the other blocks, private lands are located in the lower portions of these blocks. The timber values concerned are considerably less than those in the higher elevations.

In the Redfeather Block and to a lesser extent in the other blocks, timber management plans are definitely hindered by the complicated land ownership patterns. Sales of national forest timber in areas where the percentage of alienated land is high should be tied in with the cutting of private land timber as much as possible. The problem of securing rights-of-way across private land to national forest land is ever present. Forest officers should secure the needed rights-of-way in advance in

areas where timber sales are anticipated. There may be some adjustments in planning and revision of cutting budgets due to the blocking of access to national forest timber by private land ownership.

Acquisition of key tracts of privately owned lands which are blocking access to national forest timber should be carried on aggressively. The general land exchange policy is to dispose of isolated tracts in the foothills zone where the forest has very minor ownership for key tracts important for recreation or timber and tracts needed for access to logging compartments.

7. Reserved Areas

The Roosevelt National Forest has only one reserved area, the "Rawah Wild Area." It contains 26,525 acres of national forest land of which 19,790 are timbered lands and the remainder barren and grassland. Regulations prohibit timber cutting of any kind in this "Wild Area." The Revreation Plan also provides for special consideration of cutting along roadsides, streamsides and waterfront zones.

RESULTS FROM PAST MANAGEMENT PLANS

The ultimate management objectives of previous plans are the same as those of today. The lack of adequate markets and transportation has kept the cut down, thus curtailing progress in getting stands in a good silvicultural condition. The cumulated difference between allowable cuts and actual cuts for the past 40 years is close to 900 million feet, b.m.

The forest, in the past, was broken up into three working circles as follows:

Working Circle	Date Plan Approved	Area M Acres	Total Volume MMBM	Annual Allowable Cut MBM
Boulder-Estes	3/13/28	177	349	8,500
Laramie River	5/18/26	126	885	14,374
Poudre	4/24/50	303	798	11,934
TOTAL	XXX	606	2,032	34,808

In 1955 the allowable cut was reduced to 21,000 MBM. This was to serve as an interim figure--until the forest inventory program was completed for the forest.

The total cut from 1915 to 1958 inclusive, is 396 MMBM. The average annual cut quota for the forest has been 14 million feet b.m. whereas the average annual cut for the past ten years is 11 million feet.

The prevalence of dwarfmistletoe was recognized in past plans. The removal of infected trees was limited to those of merchantable size. Silvicultural systems used in lodgepole pine prior to 1950 was some type of a partial cut. During the period in which railroad ties were the major product, only trees suitable for making ties were marked for cutting. This left a residual stand of small and large trees, all of which were heavily infected with mistletoe. As sawlogs came into demand, the stands were commercially clear cut for sawlogs. This left a residual stand of small trees heavily infected with mistletoe. All kinds of partial cuttings have speeded up mistletoe propagation. The only seedling-saplings or pole stands that are now free of the disease are those that came in after a burn or on completely clear cut areas.

TIMBER CUT AND SOLD
ROOSEVELT NATIONAL FOREST

Years	Timber Sold				Timber Cut			
	No. Sales	MBM	Value	Avg. Sell. Price	MBM	Value	Avg. Sell. Price	Receipts
1915 FY	74	1,513:	2,235:	1.48:	1,305:	1,984:	1.52:	1,838
1916 FY	58	675:	868:	1.29:	854:	1,067:	1.25:	1,063
1917 FY	62	500:	694:	1.39:	352:	527:	1.50:	597
1918 FY	112	5,868:	11,540:	1.97:	2,339:	3,308:	1.41:	6,365
1919 FY	126	10,274:	24,254:	2.36:	4,898:	10,572:	2.16:	12,340
1920 FY	119	15,151:	38,844:	2.58:	8,217:	22,455:	2.73:	20,503
1921 FY	73	1,479:	3,229:	2.25:	3,499:	11,387:	3.25:	8,463
1922 CY	85	3,759:	13,395:	3.60:	5,701:	14,809:	2.60:	23,181
1923 CY	56	454:	1,001:	2.27:	4,785:	19,005:	3.97:	20,304
1924 CY	74	6,116:	17,406:	2.85:	4,236:	13,998:	3.30:	9,697
1925 CY	124	28,664:	77,879:	2.72:	7,089:	23,323:	3.29:	21,127
1926 CY	106	21,541:	65,143:	3.02:	4,897:	23,685:	4.84:	23,257
1927 CY	148	5,577:	16,944:	3.04:	9,362:	34,937:	3.73:	34,740
1928 CY	154	46,651:	86,746:	2.37:	15,209:	47,106:	3.10:	51,751
1929 CY	155	5,319:	12,643:	2.38:	17,131:	51,290:	2.99:	46,943
1930 CY	137	12,694:	27,400:	2.16:	20,489:	48,790:	2.38:	43,085
1931 CY	210	2,534:	5,563:	2.20:	11,145:	23,504:	2.11:	22,162
1932 CY	178	2,458:	4,871:	1.98:	4,991:	9,993:	2.00:	6,145
1933 FY	159	2,391:	4,494:	1.88:	2,754:	5,154:	1.87:	5,448
1934 FY	171	1,349:	2,556:	1.89:	5,168:	11,932:	2.31:	12,434
1935 FY	297	2,200:	3,715:	1.69:	6,691:	16,013:	2.39:	17,289
1936 FY	183	6,262:	12,678:	2.02:	11,641:	27,337:	2.35:	19,372
1937 FY	157	4,641:	10,567:	2.28:	8,609:	19,497:	2.26:	18,306
1938 FY	149	30,008:	62,130:	2.07:	16,837:	31,712:	1.88:	34,104
1939 FY	128	110,737:	248,888:	2.25:	13,638:	30,727:	2.25:	37,619
1940 FY	192	2,609:	6,224:	2.39:	8,214:	16,578:	2.02:	11,039
1941 FY	127	5,495:	13,744:	2.50:	7,533:	16,402:	2.18:	14,072
1942 FY	126	9,950:	20,113:	2.02:	12,905:	27,584:	2.14:	33,939
1943 FY	112	2,129:	4,876:	2.29:	9,975:	24,732:	2.48:	23,712
1944 FY	84	4,803:	15,164:	3.16:	9,179:	22,058:	2.40:	25,113
1945 FY	75	1,119:	3,035:	2.71:	9,293:	22,363:	2.41:	33,366
1946 FY	120	2,840:	6,376:	2.25:	11,011:	29,478:	2.68:	30,333
1947 FY	91	28,060:	154,648:	5.51:	9,134:	28,516:	3.12:	34,871
1948 FY	84	2,633:	12,899:	4.90:	13,072:	52,247:	4.00:	45,085
1949 FY	57	8,673:	33,112:	3.82:	7,837:	28,839:	3.68:	26,503
1950 FY	54	3,462:	10,111:	2.92:	10,633:	34,804:	3.27:	30,762
1951 FY	85	16,749:	94,237:	5.63:	10,434:	37,292:	3.57:	49,462
1952 FY	86	13,395:	112,713:	8.41:	9,319:	35,555:	3.82:	42,641
1953 FY	72	9,482:	48,294:	5.09:	13,889:	62,397:	4.49:	73,111
1954 FY	75	3,481:	14,600:	4.19:	12,472:	58,001:	4.65:	55,749
1955 FY	76	5,708:	28,004:	4.91:	14,661:	72,023:	4.91:	84,801
1956 FY		39,213:	516,909:	13.18:	14,934:	83,270:	5.58:	99,168
1957 FY	55	2,180:	11,908:	5.46:	9,973:	53,733:	5.39:	48,791
1958 FY	73	3,045:	17,841:	5.86:	9,756:	65,311:	6.69:	74,095

59
60
61

8,600
7,400

SILVICULTURAL SYSTEM

A silvicultural system of commercial clear cutting of overmatured sawtimber has been in effect for a number of years. Under present merchantability standards, this system removes most of the lodgepole pine 8 inches d.b.h. and larger, and other species 10 inches d.b.h. and larger, from areas designated for cutting. In principle, this system will be continued until all overmatured stands have been harvested. The establishment of processing plants that will utilize sub-sawtimber size material will permit a more complete cleanup job of the cutover areas.

In preparing working circle plans, the following silvicultural guide will be used:

> Clear cut at rotation age with even-age management as the objective. Partial cutting will be limited to occupancy zones such as recreation areas, waterfronts, and other areas requiring special treatment when it is necessary to remove trees for the protection of the public or for sanitation purposes.

Regional marking guides are contained in Forest Service Handbook, Category 2, 2442.8.

MANAGEMENT OBJECTIVES

The attainment of the sustained yield capacity for the forest is the ultimate timber management objective. It is believed that under good silvicultural practices, an average annual growth per acre of 150 board feet is within reason. This growth distributed over the 536,394 acres of commercial forest land represents a total annual growth of some eighty million board feet. This is approximately four times the current allowable cut. To obtain this long-range growth objective, all overmatured stands, diseased stands and under and over-stocked stands, must be put into good growing condition. At the present time, there is unsatisfactory growth on three-fourths of the forest's commercial forest area.

Short-term, ten-year, programs will be included in the working circle plan directed so that the long-range growth objective may be reached by the year 2000. Such programs should be guided by the following:

1. All overmatured sawtimber stands should be harvested within the next 40 years. The allowable cut will be reviewed and recalculated at least every 10 years. As better information is obtained in regard to volume, losses, economics, etc., it may be found desirable to adjust the length of the liquidation period for the over-aged stands.

2. Reduce infections of dwarfmistletoe and other diseases such as stem canker to the lowest practical levels. More than half of the lodgepole pine stands, regardless of age, and a larger percentage of the ponderosa pine stands are heavily infected with dwarfmistletoe. Losses from this disease in lodgepole pine sawtimber stands are as high as 3000 board feet per acre.

3. Develop a desirable distribution of age classes within the following periods.

   Lodgepole pine during the first rotation.

   Engelmann spruce during the first two rotations.

4. Initiate a reforestation program that will:

   a. Assure adequate stocking on cut-over areas within five years after cutting. This will average about 2000 acres of fill-in planting per year.

   b. Fill-in planting of some 25,000 acres of poorly stocked ponderosa pine type.

   c. Plant some 50,000 acres of old burns that are either poorly or non-stocked.

5. Maintain a good stocking in lodgepole pine stands by commercial and non-commercial thinnings.

6. Maintain insect infestations at not to exceed the current endemic level. Keep in mind the explosive build-up characteristics of the Black Hills and/or the Mountain pine beetle in lodgepole and ponderosa pine as well as the past history of the Engelmann spruce beetle in the Region.

7. Keep fire damage within "PAR" objective.

The following will be accomplished in order to attain the above objectives:

a. Establish a local forest industry that will utilize the allowable cut of sawtimber. This means at least doubling present plant capacity. Timber sale promotions will be stepped up to accomplish this by 1970.

b. In cooperation with adjacent forests, establish a forest industry in northern Colorado or southern Wyoming that will utilize small round material from trees smaller than 10.0 inch d.b.h. A pulp, ground, or chipped wood plant could use this size material. The raw material would come

from old tie cutover areas, small trees in current saw-timber sales, and from commercial thinnings in lodgepole pine. Such an industry will be needed to eventually utilize and clean up large areas of what is now a lodgepole pine seedling-sapling type heavily infected with dwarf-mistletoe. This will be geared for accomplishment by 1970.

c. Do a good timber management job. The large public use of the forest created by the adjacent national park and near-by cities, dictates the maintenance of aesthetic values in all timber activities. Silvicultural and slash disposal practices as well as camp requirements will be directed toward maintaining desirable aesthetics of the land. Clear cut areas will be kept to a minimum in size. A good slash disposal job will be required. All of this can be obtained by good timber sales administration.

   A continuing public relations program in educating the people in silvicultural and timber harvesting practices will be included in "I&E" plans.

d. To accomplish the over-all management objectives set forth in this general statement, training of all forest employees will receive high priority. If all employees are to keep abreast of research findings and changing conditions in the timber management field, a continuous training program will be needed in order to accomplish an efficient timber management program. On-the-job training, self-training through review of publications and other correspondence, group training, closer association with the trainee by the trainer, assignments in the form of details and other methods will be used to accomplish the job to a high professional standard.